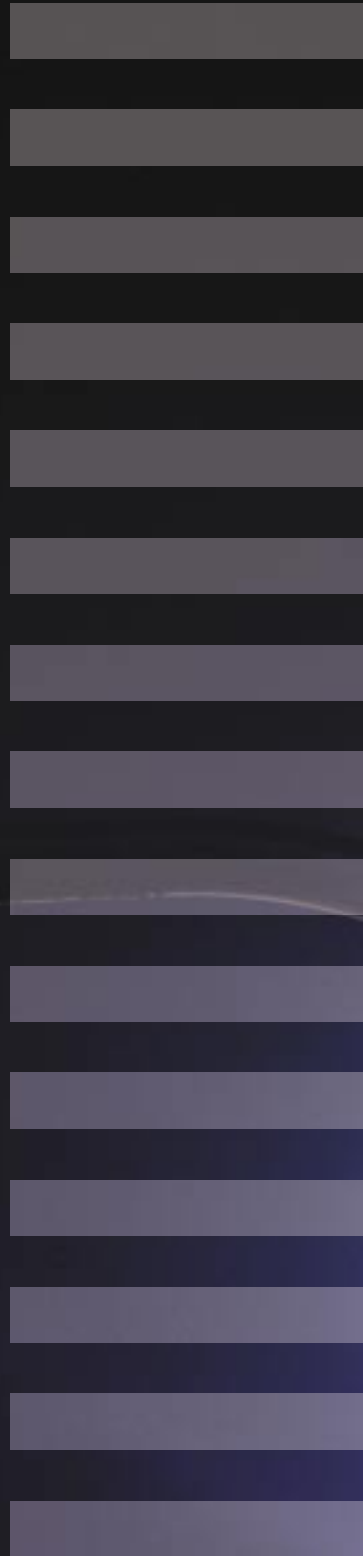


Helping you achieve excellence in global manufacturing.

IBM automotive manufacturing
productivity solutions



For many drivers, speed equals exhilaration. As a manufacturing executive in the automotive industry, you're more likely to consider speed as synonymous with success. You know that to survive, your company must respond at least as fast as competitors due to global, ever-changing customer and market demands. To thrive, it must respond even faster.

IBM Business Consulting Services can help your company evolve its worldwide manufacturing processes and systems in order to launch new product lines more quickly than ever before. Move production from one area of the world to another almost overnight. And run a lean, demand-driven supply chain. We offer innovative answers to today's complex manufacturing challenges, helping to provide your company with a competitive edge that can shift productivity — and profitability — into high gear.

A focus on time, quality and cost

Clearly, the days of discrete automotive manufacturing systems are over. What was once siloed and rigid must become integrated, flexible and virtualized. All information must flow seamlessly in all directions, to and from plant floor devices, controllers, designers, engineers and suppliers, as well as across plants in some cases. It's one of the few ways to dramatically improve productivity — as measured by time-to-market, product and process quality, and cost-efficiencies — throughout your manufacturing operations. It's also one of the few ways to achieve the kind of responsiveness and flexibility needed to secure a strong position in the global automotive industry.

A transformation of this sort can seem daunting. It involves closely examining your worldwide manufacturing systems and processes, identifying where productivity improvements can be made, and then evolving your business — without disrupting operations. Look to IBM to help you, every step of the way. Using IBM Automotive Manufacturing Productivity Solutions — our comprehensive portfolio of offerings developed specifically for passenger vehicle, heavy truck

and heavy equipment manufacturers and their suppliers — we can provide you with a roadmap and solution tailored to your unique business needs.

Is your company losing traction?

Automotive manufacturing today comes with a long list of challenges. The marketplace is constantly shifting, and production must shift with it. If your company cannot rapidly meet surges in demand anywhere in the world, or customize cars for local markets, customers will notice, and satisfaction will erode. What's more, if competitors can bring new, innovative products to market faster than your company can, your market share will almost certainly decline, as will your ability to capture emerging markets.

To be a market contender, you should have lean, just-in-time (JIT) manufacturing processes, a prerequisite to delivering cars and components around the world — profitably. And you need to readily collaborate and communicate with suppliers and partners seamlessly and immediately, to help ensure that your company has the manufacturing components it needs, when it needs them.

Complex, costly and inflexible information technology (IT) processes and systems are the primary roadblocks keeping most automotive manufacturers from overcoming these types of challenges to gain competitive ground. Integrating top floor processes — including enterprise resource planning (ERP) systems — with plant floor processes takes enormous effort and time, but rigid, inefficient processes are more costly in the long run. They significantly increase the risk associated with getting new production lines and plants up and running, and drain valuable resources. Also, without enterprisewide integration and standardization, data is neither up-to-date nor easily accessible, and visibility across the value chain is limited. Paradoxically, adding on to existing IT systems as a way to address these problems can reduce flexibility, leading to excessive IT investments and maintenance costs.



The road ahead can be smoother

Just as automobile consumers insist on real-time responsiveness from vehicles, the industry demands the same of automotive companies: If you cannot rapidly change a design, an assembly line, a supplier — any aspect of your operations — you'll get left behind. That's why your company must become an On Demand Business — an enterprise whose business processes are integrated internally, as well as with key partners, suppliers and customers, so that it can respond with speed to virtually any customer demand, market opportunity or external threat. Transformation is nothing short of a competitive imperative.

Becoming an On Demand Business, however, is not a one-time, rip-and-replace event. Just as consumers expect a smooth ride from their cars, you should plan on a smooth, well-mapped transformation journey, using an evolutionary, phased approach.

You can begin with one application in one plant. When that proves effective, you can roll that application out in one or more additional plants, or add a second application at the same plant. It is anticipated that your On Demand Operating Environment will evolve to encompass not only your manufacturing processes, but also core business processes, across the enterprise — from product design to marketing and sales to after-sales services. It is also anticipated that manufacturing and key business processes will also be integrated with those of suppliers and other partners critical to your business's survival.

As your company continues its evolution toward becoming an On Demand Business, you can continually uncover new opportunities to transform business and IT processes so that they better serve your strategic business goals. It is anticipated that there will be chances to:

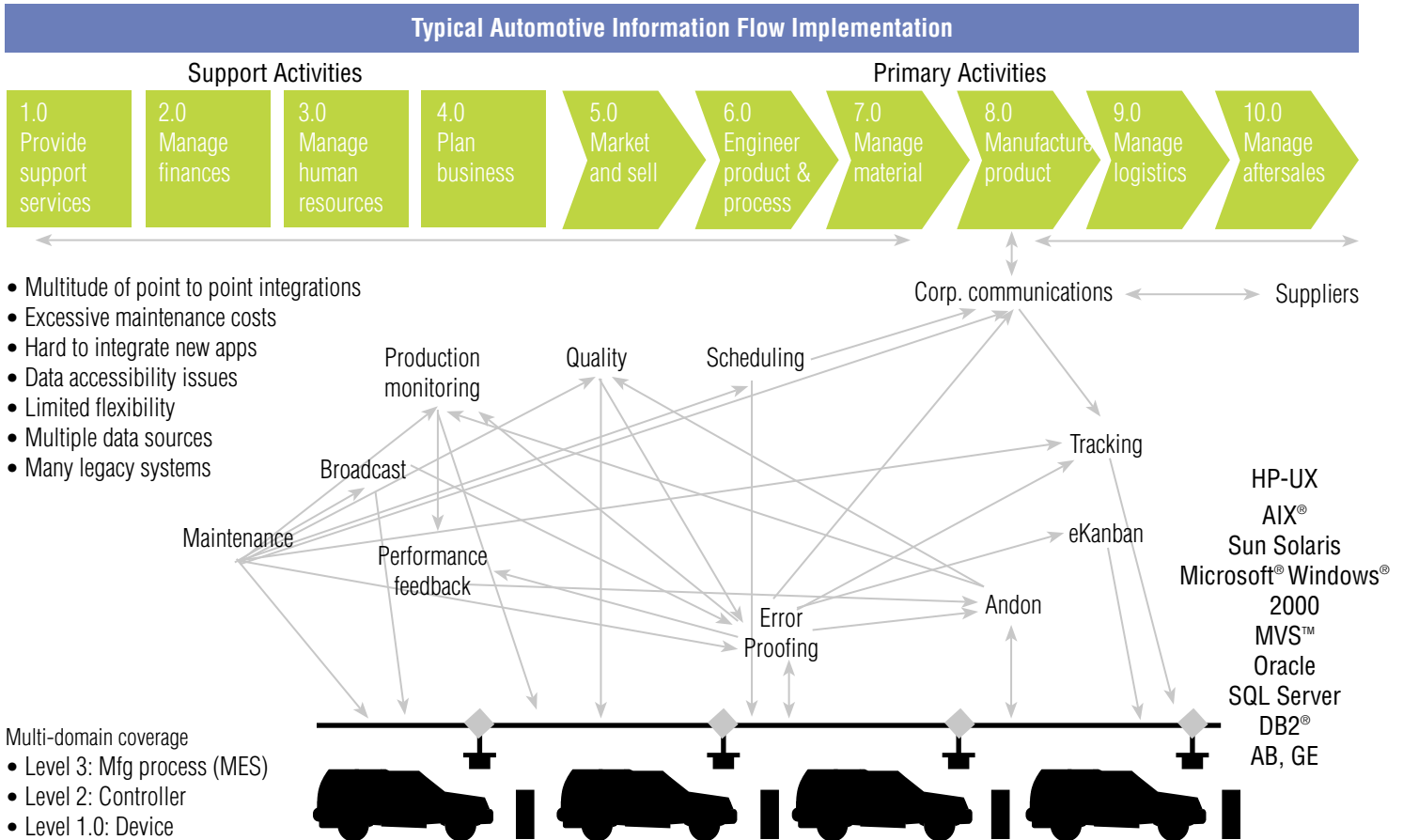
- Automate and integrate core processes in areas that have the potential to deliver a rapid return on investment (ROI), while reallocating funds for future initiatives
- Establish best-in-class, standardized business and IT processes that leverage an open-standards-based infrastructure to deliver greater scalability, flexibility and reliability

- Centralize IT deployment, delivery and management to help reduce associated costs
- Better support commercial, off-the-shelf (COTS) applications, while leveraging existing investments in, and increasing utilization of, IT assets.

Introducing IBM Automotive Manufacturing Productivity Solutions

IBM is well positioned to help your company realize the benefits associated with business transformation. IBM Automotive Manufacturing Productivity Solutions can help you evolve your manufacturing processes so that critical information can flow across the enterprise and supply chain in near real time, thereby helping enable significant productivity improvements in time-to-market, process and product quality, and cost-efficiencies.

Manufacturing processes “before” integration



Offered through IBM Business Consulting Services, all Automotive Manufacturing Productivity Solutions encompass IBM's leading-edge, proven methodologies and tools, hardware, software and services, as well as our deep industry expertise and business process know-how. And they cover the various aspects of manufacturing, from quality assurance, warehouse management and shipping to ERP, customer relationship management and regulatory compliance. Our primary solution sets focus on the following three areas of manufacturing:

- Shop-to-enterprise-integration systems — Enable plant-floor information to be integrated with enterprise and supply chain systems, including those of suppliers, to optimize logistics, distribution and procurement, thereby helping to achieve the desired result of improved product quality and better plant management decision making. This solution set also supports the deployment of new technologies like radio frequency identification (RFID) as

enablers for process improvements. It also allows you to optimize management of capital assets, including buildings, other facilities and equipment, and to better control and optimize capital expenditures so that they have the potential to deliver the greatest business value.

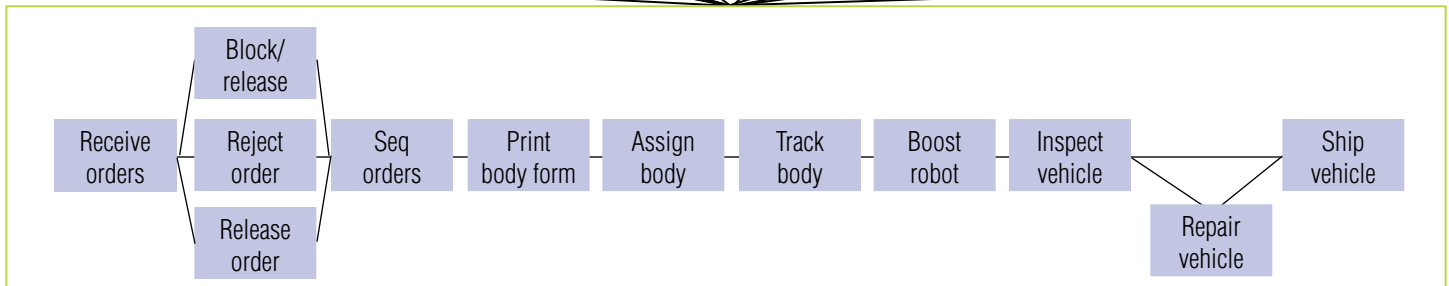
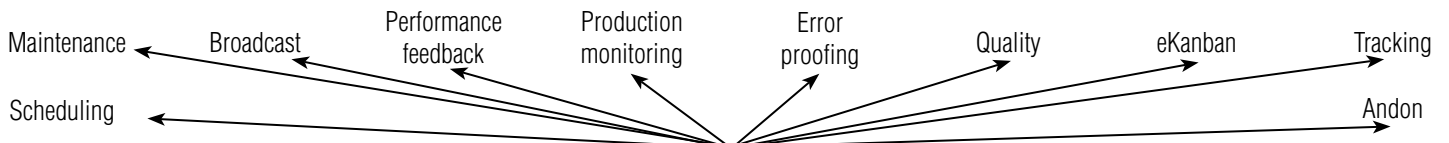
- Enterprise management systems (EAS) — Allow procurement, logistics and other EAS systems to be integrated with supply chain systems, including suppliers' applications. Enterprise management systems can help reduce inventory costs and improve forecast accuracy.
- Supply chain management systems — Facilitate performance improvements in every area of the supply chain, including strategy, planning, logistics and distribution, and procurement. This solution set helps you integrate your suppliers into your business processes with standards-based technologies; these technologies can then be further extended to integrate partners and customers.

Manufacturing processes “after” integration

IBM's Solution: Enabling Plant Floor Information

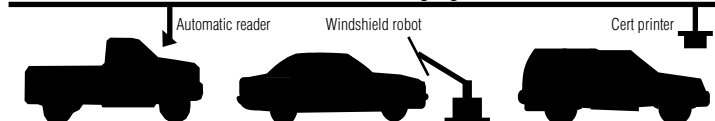
Open standards-based technology

- Standard plant floor communications and components
- Standard application connectors
- Manageable, repeatable processes
- Leverage existing systems - not rip and replace



Plant Interface Services

Database model, Middleware messaging, Device communications



A closer look — service-oriented architecture for the automotive industry

IBM Automotive Manufacturing Productivity Solutions employ Web services in a service-oriented architecture (SOA) designed specifically for the automotive industry.

An SOA is a technology framework that “componentizes” business processes and the IT functions that support them, in order to extend those processes to your constituents, both internally and externally. Web services are self-contained, modular applications that are designed to work together without relying on custom-coded connections. They can be combined and recombined to help meet

Helping boost productivity in manufacturing

	Helping speed time-to-market	Helping improve process and product quality	Helping reduce costs
Shop-to-enterprise-integration systems	Get new plants and systems up and running quicker by replicating proven, flexible processes and technology.	Leverage best-in-class processes for continuous improvements shared across plants around the world.	Reuse existing hardware and software to allow for savings and lower training and maintenance costs.
Enterprise management systems	Integrate diverse applications to avoid re-keying data and performing redundant maintenance processes.	Monitor product and process quality better by turning data into actionable information.	Automate processes by leveraging real-time information through one common system.
Supply chain management systems	Integrate suppliers into your business processes to help improve material inventory management and delivery scheduling.	Improve the quality of data used in internal business processes via standards-based collaboration across the value chain.	Leverage lower-cost COTS applications as a basis for improving processes and lowering software development costs.

changing business needs, potentially leading to shorter development cycles with less effort expended and substantially lower costs — and, ultimately, greater business flexibility.

Based on open standards, IBM's SOA environment is designed to enable and accelerate integration between existing (even homegrown) systems, as well as new applications. It can also scale to support virtually any number of applications — from any vendor, running on any platform — and leverages industry-leading virtualization and autonomic technologies to further facilitate your company's smooth and successful transformation to On Demand Business. Our professionals can provide an entirely new SOA solution for you, from the ground up, or integrate an SOA solution with your existing environment.

Automotive Manufacturing Productivity Solutions include the following specific components:

IBM systems and storage

Our hardware platforms are designed to be highly available, reliable and scalable. Automatic failover capabilities remove single points of failure, helping to reduce unplanned downtime for your plant. Our platforms are also designed to expand capacity as needed, support a variety of storage systems, and simplify management with tools and interfaces for centralizing and automating processes, such as data backup and storage partitioning. And they can support your plant requirements whether you run the IBM AIX®, Linux® or Microsoft® Windows® operating system.

In addition, network-attached storage solutions allow data to be shared across all systems, helping to eliminate the need to replicate information, reduce the complexity of recovery scenarios and ease the management of multiple images and configurations. Our storage solutions also provide automatic and transparent mirroring of data while performing at speeds close to that of locally attached storage devices.

Key offerings include IBM **@server**® systems, IBM **@server** BladeCenter® systems, IBM TotalStorage® solutions, IBM Virtualization Engine™ console and IBM Grid Toolbox. In addition, automotive-industry experts from IBM Engineering and Technology Services can assist with everything from systems design and deployment to hardware customization.

IBM software

Our open-standards-based middleware provides the enabling technology required to create a scalable environment that integrates disparate applications and data. It also supports the deployment of mobile devices and RFID technologies that can enable additional process improvements across the value chain.



Key offerings include IBM WebSphere® Portal, which quickly streamlines production and enables data sharing while helping to reduce associated costs. IBM WebSphere Business Integration Server Foundation distributes workload across multiple servers through sophisticated load balancing and clustering capabilities and is designed to enable highly available active server clusters by helping to reduce the amount of time it takes to recover and service client requests. Additional software offerings include IBM DB2® information management software, IBM WebSphere MQ, IBM WebSphere Business Integration Modeler and IBM Tivoli® System Automation for Multiplatforms.

IBM services

Through our assessment and design services, IBM Business Consulting Services professionals can evaluate your current business processes and models, as well as your applications and infrastructure. Our innovative assessment methodologies and tools help pinpoint where your company can get the greatest ROI. We then work with you to design a solution for transforming your processes efficiently and effectively; this may include outsourcing of

selective processes or infrastructure management to help you achieve new productivity breakthroughs. System integration and application development services are provided by IBM Global Services, which has combined its business and technology acumen to become one of the world's best system integrators.

IBM Business Partner solutions

IBM has a vast global network of Business Partners, enabling us to provide best-in-class solutions from such industry leaders as ABB, Cisco, Intermec Technologies, i2, Manugistics, MRO Software, Oracle, QAD, Rockwell Automation, SAP, Schneider Electronics, SSA Global, Symbol Technologies, and WhereNet Corp.

IBM financing

As one of the world's largest provider of IT financing, IBM Global Financing can help you optimize your investments, regardless of your company size, type or location. IBM Project Financing™ offerings provide customized, comprehensive financing that allows you to match cost outlays to expected benefits.

Get on the path to better productivity now

Let IBM help you address the myriad challenges that your company faces as a global automotive manufacturer. We'll quickly configure a solution that is designed to meet your business requirements while leveraging your existing investments — helping to fast-forwarding your transformation to becoming an On Demand Business, and your ability to move swiftly into emerging markets, improve product and process quality, and reduce costs.

For more information

To learn more about IBM Business Consulting Services, contact your IBM representative or visit:

ibm.com/bcs

To learn more about IBM Automotive Manufacturing Productivity Solutions please visit:

ibm.com/industries/automotive



© Copyright IBM Corporation 2005

IBM Global Services
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
08-05
All Rights Reserved

IBM, the IBM logo, the On Demand Business logo, AIX, BladeCenter, **@server**, DB2, IBM Project Financing, MVS, Tivoli, TotalStorage, Virtualization Engine and WebSphere are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries or both.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries or both.

Linux is a trademark of Linus Torvalds in the United States, other countries or both.

Other company, product and service names may be trademarks or service marks of others.

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.